



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8

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February 14, 2008

Ref: EPR-N

Mr. Robert A. Bennett, State Director  
Bureau of Land Management  
Wyoming State Office  
5353 Yellowstone Road  
Cheyenne, Wyoming 82009

Re: Revised Draft Supplemental Environmental Impact  
Statement for the Pinedale Anticline Oil and Gas  
Exploration and Development Project  
Sublette County, Wyoming CEQ #20070542

Dear Mr. Bennett:

In accordance with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609, the U.S. Environmental Protection Agency Region 8 (EPA) has reviewed the Revised Draft Supplemental Environmental Impact Statement for the Bureau of Land Management's (BLM) proposed Pinedale Anticline Oil and Gas Exploration and Development Project (Revised Draft SEIS). The Revised Draft SEIS provides additional alternatives and impacts analyses in response to changes to the preferred alternative and to comments received on the December 2006 Draft SEIS.

The Revised Draft SEIS supplements a previous EIS and a 2000 Record of Decision authorizing up to 700 producing wells in the Pinedale Anticline Project Area (PAPA). The Revised Draft SEIS assesses both the site-specific and cumulative environmental impacts of year-round drilling, completions, and production of up to 4,399 additional natural gas wells on up to 12,885 acres of new disturbance. The year-round drilling is proposed within certain areas of the PAPA that coincide with big game crucial winter habitats and greater sage-grouse seasonal habitats. The PAPA encompasses 198,037 acres and is located directly south of Pinedale, Wyoming, in Sublette County. The Bridger-Teton National Forest is located west, north, and east of the PAPA and comes within 2.3 miles of the PAPA boundary. In addition, the PAPA is located approximately 11 miles west of the Bridger Wilderness Area. The Bridger Wilderness Area is a federal Class I area under the Clean Air Act, requiring special protection of air quality and air quality related values, such as visibility.

The Revised Draft SEIS considers five alternatives in detail. The preferred alternative consists of up to 4,399 additional wells on up to 12,885 acres of new surface disturbance by the year 2025. The drilling and completions within big game crucial winter habitats would occur year-round within concentrated development areas centered in a core area on the Anticline Crest. The Proposed Action also includes installation of a liquids gathering system in the central and southern portions of the PAPA complementing the existing liquids gathering system in the northern portion of the PAPA. Tier 2 equivalent emission controls would be installed on 29 out of 48 drilling rigs at peak drilling in 2009. The proponent's new Proposed Alternative is similar to the Preferred Action in that it consists of the same project components including 4,399 additional wells on up to 12,885 acres of disturbance. However, the core development area considered under the Preferred Alternative is different spatially from the Proposed Action and includes a potential development area (PDA). With the PDA, the Preferred Alternative has the potential for year-round development on 70,200 acres, over 60% greater than the core development area proposed under the Proposed Action. In addition to the Proposed Action and Preferred Alternative, the Revised Draft SEIS considers two other action alternatives that differ primarily in areas where year-round development may occur; installation of liquids gathering systems; and air quality mitigation measures. The Revised Draft SEIS also includes a No Action Alternative, which is based on elements set forth in the 2000 Pinedale Anticline Record of Decision (ROD).

EPA Region 8 has reviewed the Revised Draft SEIS and has three primary concerns, which are briefly highlighted in this letter: air quality impacts to visibility and ozone, and groundwater impacts. The enclosed "Detailed Comments" provides more discussion of our concerns regarding these issues as well as our comments on the proposal's impacts to surface water quality and wetlands.

#### AIR QUALITY IMPACTS - VISIBILITY

The Revised Draft SEIS discloses the significant and unanticipated impacts to visibility that occurred since implementation of the 2000 Pinedale Anticline ROD. The NO<sub>x</sub> emissions from all sources operating in the PAPA in 2005 were five times the analysis threshold set in the 2000 Pinedale Anticline ROD (Revised Draft SEIS, page 3-70). For visibility, the 2005 emissions led to a modeled 45 days of visibility impairment greater than 1.0 deciview (dv) at the Class I Bridger Wilderness Area, 5 days at the Class I Fitzpatrick Wilderness Area, and additional days at other regional Class I areas (Revised Draft SEIS, page 3-73). Under the No Action scenario (i.e., where development occurs under the provisions of the 2000 ROD) predicted 2007 visibility impacts are even higher than the 2005 predictions, with 62 days above 1.0 dv at Bridger Wilderness Area, 8 days at Fitzpatrick Wilderness Area, and additional days at other regional Class I and sensitive Class II areas (Revised Draft SEIS, page 4-78). Given the unforeseen and significant impacts that have occurred from the development of the 642 producing oil and gas wells approved under the 2000 Pinedale Anticline ROD, EPA recommends the Revised Draft SEIS identify effective and enforceable mitigation strategies to ensure environmental protection as the proposed 4,399 additional wells on the Pinedale Anticline are developed. EPA also recommends the Revised Draft SEIS provides a plan to mitigate the significant air quality environmental impacts resulting from the existing oil and gas development on the PAPA.



EPA and the Wyoming Department of Environmental Quality (WDEQ) participated on the Air Quality Stakeholders group that provided early guidance and comments to the BLM on the air quality modeling and visibility mitigation plan included in the December 2006 Draft SEIS. The air quality analysis and a substantial part of the visibility mitigation plan negotiated for the December 2006 Draft SEIS have been carried forward to this Revised Draft SEIS. However, the mitigation plan included in this Revised Draft SEIS includes significant modifications of the original commitments. EPA is concerned these modifications weaken the plan's ultimate goal and create uncertainty about achieving the ultimate goal of zero days of visibility impairment at Bridger Wilderness Area. The modified commitments suggest reluctance to commit to the full mitigation plan and have eroded EPA's confidence that the goal of zero days will be achieved. Without further specificity on how the ultimate goal will be achieved, EPA believes that the proposed project will result in at least ten days of visibility impairment at the federal Class I Bridger Wilderness Area. EPA considers ten days of visibility impairment greater than 1.0 dv a significant, adverse impact to air quality.

#### AIR QUALITY IMPACTS - OZONE

The Revised Draft SEIS updates the ozone analysis with a current state-of-science photochemical grid model. This level of analysis is particularly important given the elevated ozone levels that have been recorded at ambient air monitoring stations neighboring the PAPA. The BLM modeling analysis predicts ozone concentrations approaching EPA's current National Ambient Air Quality Standard (NAAQS). Specifically, ozone concentrations for the Proposed Action are predicted to be 0.0782 ppm near the PAPA. For Alternative C with the 80 percent reduction in drill rig emissions, ozone concentrations are predicted to be 0.0765 ppm near the PAPA (Alternative C is similar to BLM's Preferred Alternative). However, the Revised Draft SEIS does not provide analysis of ozone concentrations for the first five years prior to full implementation of the 80 percent reduction in drill rig emissions under the Preferred Alternative air quality mitigation strategy. The performance evaluation of the photochemical model supported the model's reliability in predicting ozone but also noted a small underestimation bias. With predicted ozone concentrations approaching the current standard and an underestimation bias in the model, EPA is concerned about the potential environmental and health impacts associated with the projected 0.0782 and 0.0765 ppm ozone concentrations. This concern is further substantiated by the elevated ozone concentrations above the current 0.08 ppm standard recorded at ambient air monitoring stations near the PAPA in 2005 and 2006. In addition, natural gas development and production under the Preferred Alternative is anticipated to continue until 2065.

In view of the ozone levels monitored, modeled and predicted, EPA recommends that an air quality mitigation strategy be developed to address these potentially significant air quality and health impacts. The SEIS should also include modeled demonstrations that the proposed action will not incrementally contribute to violations of a NAAQS. In addition, EPA is currently reviewing the national primary and secondary standards for ozone. This project may be affected if EPA determines that a revision to the current ozone standard is necessary and appropriate. Consequently, EPA may have further comments on the project's ozone analysis after the final rule is issued.



## GROUNDWATER

The Revised Draft SEIS includes important new information on groundwater monitoring in the PAPA. The monitoring data suggest that current drilling and production activities on the PAPA have contributed to contamination of an aquifer used as a drinking water source. Existing benzene contamination exceeding the Drinking Water Standard (maximum concentration level or MCL) in two wells was attributed to oil and gas exploration activities in the Revised Draft SEIS. Further, benzene and other hydrocarbons have been detected in 88 of the approximately 230 water supply wells monitored. The Revised Draft SEIS does not disclose the monitored concentrations; it is, therefore, unknown how much the monitored concentrations are above or below the MCL. Based upon the extent of contamination of these two wells completed in an aquifer used as a source of drinking water and benzene contamination in approximately one third of the other wells monitored, EPA is concerned about the significance of existing and potential future impacts associated with activities in the PAPA. EPA believes that such impacts are environmentally unsatisfactory.

The Revised Draft SEIS provides only raw data. EPA believes the Revised Draft SEIS does not provide an adequate analysis of the effects of the expanded well field on groundwater; nor does it discuss the potential effectiveness of the proposed mitigation measures. Although the 2000 Pinedale Anticline ROD required all wells within one mile of proposed development be monitored on an annual basis, there is no documentation of how many wells exist within this defined buffer area nor can it be documented that monitoring took place in the defined areas. The Wyoming State Engineer has identified 4000 points of use within the PAPA. While some of these points of use may be duplicates, monitoring has taken place in only approximately 230 wells. The full extent of the benzene and hydrocarbon contamination in the PAPA has not been comprehensively evaluated. Although there are distinct aquifers in this area described in the Revised Draft SEIS, information on impacts and potential mitigation measures were generalized across all of the aquifers. Further, the Revised Draft SEIS acknowledges the source of the widespread low concentration detections (lower than the MCL) is not known (Revised Draft SEIS, page 3-85). EPA recommends that a more clear understanding of the extent of the benzene and hydrocarbon contamination, the aquifers, and the source of contamination is needed to develop effective mitigation measures.

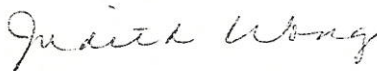
The Revised Draft SEIS provides mitigation measures intended to reduce impacts to groundwater. These measures, however, were not identified as necessary nor were they evaluated as to their effectiveness in any of the alternatives. As the source of the widespread contamination remains unclear, it is difficult to identify and implement appropriate and effective mitigation measures to protect valued groundwater supplies. EPA recommends that where impacts have occurred or may reasonably be expected to occur to groundwater sources as a result of oil and gas production, including but not limited to hydraulic fracturing practices, an effective and enforceable mitigation plan should be developed. The mitigation plan could specifically include plans for replacement of quality water to water users if necessary.

## EPA's RATING

Consistent with section 309 of the Clean Air Act, it is EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project. In accordance with our policies and procedures for reviews under NEPA and Section 309 of the Clean Air Act, EPA is rating this Revised Draft SEIS as "Environmentally Unsatisfactory – Inadequate Information" (EU-3) because our review has identified significant, adverse, long-term impacts to air quality and groundwater quality. The "EU" rating is based on potential adverse impacts to visibility in federal Class I areas without adequate mitigation; the extent of groundwater contamination in the PAPA where development has already occurred; and EPA's concern about further potential groundwater contamination impacts that may occur with the proposed project. Some of this contamination exceeds National Drinking Water Quality Standards. In addition, EPA is currently reviewing the national primary and secondary standards for ozone. This review will be completed by March 12, 2008. Should the ozone standard be revised, EPA may have additional comments on the SEIS and project. These impacts are of sufficient magnitude that the proposed action should not proceed as proposed. Further, the "EU" rating makes this project a candidate for referral to the Council on Environmental Quality (CEQ) if the unsatisfactory impacts we identified are not resolved. The rating of "3" is based on the lack of adequate information to characterize existing groundwater contamination or the extent of potential groundwater impacts from the proposed action. The Revised Draft SEIS also does not contain adequate analyses from air quality modeling to disclose the predicted ozone concentration under varying emission scenarios. This "3" rating indicates EPA's belief that the Draft EIS is not adequate for purposes of our NEPA and/or Section 309 review, and thus, should be formally revised and made available for public comment in a supplemental or revised Draft EIS. The "3" rating also makes this project a potential candidate for referral to CEQ. In addition to EPA's detailed comments on the Revised Draft SEIS, a full description of EPA's EIS rating system is enclosed.

If you have any questions regarding our comments or this rating, please contact Larry Svoboda, Region 8 NEPA Program Director, at 303-312-6004, or Carol Campbell, Acting Assistant Regional Administrator of Ecosystems, Protection and Remediation at 303-312-6340.

Sincerely,

  
for Robert E. Roberts  
Regional Administrator

cc: John Corra, Wyoming Department of Environmental Quality  
Chuck Otto, BLM Pinedale Field Office Manager

Enclosures



**Detailed Comments by the Region 8 Environmental Protection Agency for the  
Draft Supplemental Environmental Impact Statement (SEIS)  
Pinedale Anticline Oil and Gas Exploration and Development Project  
Sublette County, Wyoming**

**Air Quality – Visibility**

The Clean Air Act requires special protection of air quality and air quality related values (such as visibility) in many of the nation's wilderness areas and national parks. Subpart II of Part C of the Clean Air Act prescribes a program specifically for the protection of visibility in federal Class I areas and establishes "as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I federal areas which impairment results from man-made air pollution." EPA's implementing regulations require states to submit implementation plans that contain such measures as are necessary to make reasonable progress towards the national requirements, and that states establish reasonable progress goals toward improving visibility on the worst days and preventing further degradation in visibility during the best days. Actions by BLM that lack adequate mitigation of potential visibility impacts could impede Wyoming's and neighboring states' ability to submit State Implementation Plans that meet the Clean Air Act requirements.

In addition to its visibility provisions, the Clean Air Act contains general provisions for a Prevention of Significant Deterioration (PSD) program designed to protect federal Class I areas from air quality degradation under Subpart I of Part C. The PSD program places an affirmative responsibility on federal land managers to protect air quality in many of the most important national parks and wilderness areas in the nation from human-caused pollution. The Wilderness Act further directs the federal land management agencies to protect the wilderness character of those areas designated as wilderness. In that Act, Congress recognized the importance of preserving designated areas in their natural condition and declared a policy to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

As stated on page 4-74 of the Revised Draft SEIS, "BLM considers a 1.0 deciview (dv) change to be a significance threshold for visibility impairment," which is consistent with other federal agencies' approach to visibility protection. Pursuant to the Clean Air Act and other provisions of law, EPA and the Federal Land Managers have developed regulations, guidance, and technical tools including models and data that land managers can use to help protect air quality in federal Class I areas. One of these is a guidance document from the Federal Land Managers' Air Quality Related Values Workgroup (FLAG), a workgroup that the federal land managers formed to develop a more consistent approach to evaluate air pollution effects on the areas that they manage. The FLAG guidance document states that impacts greater than 1.0 dv would be considered perceptible and significant for new source review purposes, and EPA supports efforts by the Federal Land Managers to coordinate and streamline their participation in



permitting. EPA has not adopted the 1.0 dv threshold into rules governing the requirements for federal or state New Source Review programs.

The Revised Draft SEIS includes analysis of modeled visibility impacts for both the current level of development in 2005 and the proposed project development through 2023. In Chapter 3.11, the Revised Draft SEIS discusses the visibility analysis conducted for 2005 and discloses the impacts of development that have occurred since BLM's 2000 Pinedale Anticline ROD. This analysis was conducted because the level of development since 2000 led to emissions that significantly exceeded those analyzed in the earlier EIS, triggering additional analysis under the 2000 Pinedale Anticline ROD. The visibility modeling analysis for the 2005 level of development predicts 45 days per year of visibility change greater than the 1.0 dv threshold at the Bridger Wilderness Area, five days per year at the Fitzpatrick Wilderness Area, and additional days at other regional Class I and sensitive Class II areas. Under the No Action scenario where development occurs under the provisions of the 2000 ROD, predicted 2007 visibility impacts are even higher with 62 days above 1.0 dv at Bridger Wilderness Area, 8 days at Fitzpatrick Wilderness Area and additional days at other regional Class I and sensitive Class II areas.

The BLM Preferred Alternative (Alternative D) proposes an air quality mitigation plan that attempts to reduce visibility impacts to Federal Class I areas from both the existing development and the proposed development. Detailed in Section 4.9.3.5 of the Revised Draft SEIS, the air quality mitigation plan provides for a two-phased approach to minimizing visibility impacts. Phase I mitigation would initiate after issuance of the ROD and would require operators to reduce project induced visibility impairment to 2005 levels. Immediately following Phase I, Phase II would require operators to reduce drill rig emissions by 80 percent over four years. The intervening years (years two through five) would have stepped 20 percent decreases in NO<sub>x</sub> emissions with corresponding decreases in the number of days of impairment in the Class I areas. The ultimate goal of Phase II mitigation is zero days of visibility impairment at Bridger Wilderness Area. However, after the five-year period and the 80 percent reduction in NO<sub>x</sub> emissions from drilling rigs, the Bridger Wilderness area is projected to have at least 10 days of impairment (greater than 1.0 dv) with impairment at other nearby Class I areas as well. During the first five years the proposed project will not meet the intent of Section 169A of the Clean Air Act (CAA) Amendments of 1977, which requires the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Federal Class I areas which impairment results from man-made air pollution."

EPA fully supports the ultimate goal of Phase II air quality mitigation: zero days of visibility impairment over 1.0 dv at the Bridger Wilderness Area. However, EPA is concerned that the commitment to achieve the goal has been weakened with the significant modifications of the original commitments. Specifically, EPA is concerned that the addition of "practicable" in the commitment for "using any and all practicable means with full consideration of all resources" and the addition of "technically and economically practicable" create uncertainty and doubt that the ultimate goal will be achieved. The modified commitments suggest reluctance to commit to the full mitigation plan and have eroded EPA's confidence that the goal of zero days will be achieved. Without further specificity on how the ultimate goal will be achieved, EPA believes



the proposed project will result in at least ten days of visibility impairment at the federal class I Bridger Wilderness Area. EPA considers ten days of visibility impairment greater than 1.0 dv a significant, adverse impact to air quality. EPA recommends BLM strengthen the language and include more specific details in the air quality mitigation plan to ensure the goal of zero days of impairment is met within a scheduled timeframe. Specifically, EPA recommends that the Revised SEIS include the air quality mitigation commitments set forth in the December 2006 Draft SEIS that if modeling cannot demonstrate achievement of this goal within five years of the ROD being signed, the Operators, BLM, EPA, and WDEQ would jointly agree to a mitigation plan that complies with the goal of zero days, using any and all available means.

### **Air Quality – Ozone Analysis**

EPA commends BLM for updating the Ozone (O<sub>3</sub>) analysis using the photochemical grid model, CAMx. The Revised Draft SEIS discloses summary results from air modeling conducted for the proposed Pinedale Anticline project and other cumulative emission sources. The maximum predicted ozone impacts using the EPA guidance approach occur near the PAPA. For Alternative C (Alternative C is similar to BLM's Preferred Alternative) with the 80 percent reduction in drill rig emissions, ozone concentrations are predicted to be 0.0765 ppm near the PAPA. The Revised Draft SEIS does not provide analysis of ozone concentrations for the first five years prior to full implementation of the 80 percent reduction in drill rig emissions under the air quality mitigation strategy. The performance evaluation of the photochemical model supported the model's reliability in predicting ozone but also noted a small underestimation bias. With predicted ozone concentrations approaching the current standard and an underestimation bias in the model, EPA is concerned with the health impacts associated with the projected 0.0782 and 0.0765 ppm ozone concentrations with this proposed project. This concern is further substantiated by the elevated ozone concentrations above the current 0.08 ppm ozone standard recorded at Sublette County ambient air monitoring stations in 2005 and 2006.

In view of the ozone levels monitored, modeled and predicted, EPA recommends that an air quality mitigation strategy be developed to address not only NO<sub>x</sub> sources, but include measures to control other O<sub>3</sub> forming precursors such as volatile organic compounds (VOCs) and formaldehyde. The SEIS should also include modeled demonstrations that the proposed action will not incrementally contribute to violations of a NAAQS. In addition, EPA is currently reviewing the national primary and secondary standards for ozone. This project may be affected if EPA determines that a revision to the current ozone standard is necessary and appropriate. Consequently, EPA may have further comments on the project's ozone analysis after the final rule is issued.



### Detailed Ozone Comments

1. The design value predictions for the reported modeling for Alternative C (Alternative C is similar to BLM's Preferred Alternative) were based on an 80 percent NO<sub>x</sub> reduction in the PAPA after four years with intervening years of 20 percent stepped decreases in NO<sub>x</sub> emissions. For the intervening years, predicted O<sub>3</sub> design value concentrations have not been reported. These values may be considerably higher and EPA recommends they be reported in the SEIS.
2. Figure 4-4 of Appendix H of the Air Quality Impact Analysis Technical Support Document for the Revised Draft SEIS upper right map depiction for Alternative C (Alternative C is similar to Alternative D, BLM's Preferred Alternative) presents the predicted difference in O<sub>3</sub> design value impacts from Alternative C with Phase II mitigation to the base case scenarios. Please clarify the location of the maximum impact location from this figure. Furthermore, the difference of 5.5 ppb presented in Figure 4-4 is not represented in Table 4-1 of Appendix H. EPA recommends the maximum predicted O<sub>3</sub> concentration near the PAPA and approximate location of these impacts be presented in the SEIS.
3. Ozone concentrations were predicted for cumulative sources in the PAPA and surrounding areas. EPA recommends the SEIS disclose ozone concentrations for PAPA specific sources in order to determine the direct project impacts. In addition, EPA recommends the analysis disclose the absolute modeled results in addition to the results calculated under EPA's guidance approach.
4. Section 5.2.2.1. EPA Guidance Ozone - Projection Approach EPA guidance for projecting future ozone concentrations using relative reduction factors to scale current observed ozone design values is required for State Implementation Plan (SIP) modeling in urban non-attainment areas. The approach is useful in the context of the current study; however, the ozone monitoring network is very sparse compared to urban monitoring networks. For this reason EPA recommends the absolute model prediction of maximum ozone concentrations be presented in addition to the "scaled" modeled attainment test (MATS) results used in SIP modeling.

### **Groundwater**

The Revised Draft SEIS includes significant new information on groundwater monitoring that was completed under a monitoring program established under the 2000 Pinedale Anticline ROD. The monitoring data suggest that current drilling and production activities on the PAPA have contributed to contamination of an aquifer used as a drinking water source. Benzene and other hydrocarbons have been detected in 88 of the approximately 230 water supply wells monitored or 38 percent of the wells tested. Existing benzene contamination exceeding the Drinking Water Standard (maximum concentration level or MCL) in two wells was attributed to oil and gas exploration activities in the Revised Draft SEIS. The Revised Draft SEIS does not disclose the monitored concentrations; it is, therefore, unknown how much the monitored



concentrations are above or below the MCL. Based upon the extent of contamination of these two wells completed in an aquifer used as a source of drinking water and benzene contamination in approximately one third of the other wells monitored, EPA is concerned about the significance of existing and potential future impacts associated with activities in the PAPA. EPA believes that such impacts are environmentally unsatisfactory.

While the monitoring data suggest significant impacts to groundwater have occurred in the PAPA, insufficient information has been provided to fully understand the nature of the existing contamination and the potential for additional groundwater contamination from the proposed action. Although the 2000 Pinedale ROD required that all wells within one mile of proposed development be monitored on an annual basis, there is no documentation of how many wells are within this defined buffer area nor is it documented that monitoring took place in the defined areas. The Wyoming State Engineer has identified 4000 points of use within the PAPA. While some of these points of use may be duplicates, monitoring has taken place in only approximately 230 wells. The full extent of the benzene and hydrocarbon contamination in the PAPA has not been comprehensively evaluated. In addition, although there are five distinct aquifers in this area described in the Revised Draft SEIS, information on impacts and potential mitigation measures were generalized across all of the aquifers.

The Revised Draft SEIS provides mitigation measures intended to reduce impacts to groundwater. These measures, however, were only identified as potential requirements and were not evaluated as to their effectiveness in any of the alternatives. As the source of the widespread low concentration detections remains unclear, it is difficult to identify and implement effective mitigation measures to protect valued groundwater supplies without understanding of the source of contamination. EPA recommends that where impacts have occurred or may reasonably be expected to occur to groundwater sources as a result of oil and gas production, including but not limited to hydraulic fracturing practices, an effective and enforceable mitigation plan should be developed. The mitigation plan could specifically include plans for replacement of quality water to water users if necessary.

Based on the information included in the Revised Draft SEIS, EPA recommends BLM develop a monitoring plan sufficient to characterize each of the aquifers throughout the PAPA. Use of industrial water wells, not designed for monitoring purposes, provides inadequate information to identify and mitigate groundwater problems. We suggest that monitoring methods approved by the Wyoming DEQ be used to ensure Quality Control over the monitoring process, including proper drilling methods and casing. Furthermore, each new well within the PAPA should be logged and sampled during drilling preventing any cross-contamination with industrial uses. EPA also suggests the Revised SEIS include a map identifying the approximately 230 wells that have been tested; the wells with detectable levels of benzene and other hydrocarbons; and the wells with benzene concentrations above the MCL.

EPA believes it is important to sustain and protect quality drinking water supplies in times of increased demand for water and especially in times of drought. Rather than using potable grade water for drilling, EPA recommends BLM consider and evaluate non-potable alternative drilling water sources in the Revised SEIS. The Fort Union Formation at a slightly



deeper depth is an aquifer with adequate quality for industrial purposes but is not of high enough quality for a water supply at this time. In addition, reuse of produced water is also demonstrated within the PAPA and could potentially be an appropriate alternative for industrial water supply.

Finally, EPA recommends the Revised SEIS include a more detailed analysis of cumulative groundwater impacts. EPA is aware of additional groundwater contamination that has occurred in the Jonah field directly south and adjacent of the Pinedale Anticline. The drilling water well in the Jonah field has monitored levels of benzene of 615 ug/l at a depth of over 900 feet with lower concentrations near surface. This information should be disclosed to the public in addition to any other existing monitoring analyses for the area.

### **No Action Alternative**

As previously mentioned in EPA's April 6, 2007, comments on the Draft SEIS, NEPA requires analysis of a No Action Alternative in order to establish an environmental impacts baseline for comparison with the Proposed Action. In the December 2006 Draft SEIS and in this Revised Draft SEIS, BLM analyzes the No Action Alternative in terms of continuing with the present course of action until that action is changed (i.e., approving wells under the 2000 ROD until approval of a new ROD). The Revised Draft SEIS states there is "uncertainty" with regard to the 2000 ROD. Any uncertainty should be resolved by examining the extent of development actually analyzed in the Pinedale Anticline Oil and Gas Exploration and Development Project EIS, that is, impacts associated with the development of 700 producing natural gas wells over a 10 to 15 year time period. EPA believes that this scenario should be the basis for the No Action Alternative rather than the No Action Alternative considered in the Revised Draft SEIS which includes the development of an additional 1,139 wells for a total of approximately 1,800 wells by the year 2011. EPA recommends the No Action Alternative and baseline analysis be revised to accurately reflect the 700 producing well scenario analyzed in the initial Pinedale Anticline EIS and implemented in the 2000 ROD.

### **Surface Water, Water Quality, and Aquatic Habitat**

In the Revised Draft SEIS's executive summary, it is acknowledged that sediment yields will be substantially increased above current conditions in six hydrologic sub-watersheds that coincide with the Anticline Crest. This conclusion is substantiated by the *Erosion Modeling, Sediment Transport Modeling and Salt Loading Technical Report* prepared by HydroGEO which was presented in Table 4.14-4 in the previous Draft SEIS (December 2006). This important finding and the table illustrating the diverse and varied effects in different subwatersheds should be re-inserted in the Revised Draft SEIS. This information provides insight and geographic pattern to a potentially significant environmental effect, and EPA recommends that this Table and a discussion of its findings should be a part of this analysis. According to the model, the average annual sediment yield would increase by 73% in the New Fork River – Alkali Creek, 102% in Mack Reservoir and 26% in the Sand Draw-Alkali Creek sub-watersheds in 2023 (under the worst case modeling scenario with no reclamation). Yet, Chapter 4.14 concludes these substantial increases in sediment yield are not expected to result in "significant" impact to surface water resources under any of the alternatives. It appears this conclusion is reached based



on a finding that the increased sediment loading, although substantial, would not impair the designated uses for these waters. The Revised Draft SEIS does not clearly explain the basis for this conclusion. EPA strongly recommends that the Revised SEIS clarify how the projected increased sediment yields are translated into projected compliance with Wyoming's narrative water quality standard for settleable solids, which states:

"In all Wyoming surface waters, substances attributable to or influenced by the activities of man that will settle to form sludge, bank or bottom deposits shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public waters supplies, agricultural or industrial water use, plant life or wildlife."

It is also clear from the Revised Draft SEIS that avoiding adverse effects to the designated uses will rely on "extensive" use of Best Management Practices (BMPs) to prevent erosion, as well as timely reclamation. To ensure adverse effects to surface water quality are avoided, EPA recommends the Revised SEIS identify: 1) the target and the threshold of change (e.g., percent change of fines, or in suspended sediment) from the target being used to determine compliance with the designated uses assigned to these waters; and 2) the level of effectiveness for the applicable BMPs; 3) the process that will be used to ensure effective implementation and maintenance of those BMPs (i.e., ongoing and future monitoring of effectiveness and implementation enforcement); 4) and how sufficient reclamation will be accomplished and monitored given the ambient ecological conditions.

The Revised Draft SEIS notes that a number of waters within the Anticline Crest are prime sport fisheries. Measures of impact to these aquatic communities from increased sediment yield could be based on either change in biological condition or change in bedded sediments (% fines). The Revised Draft SEIS notes that a report by EcoAnalysts, Inc. (2005) concluded "... there has been no discernable change in ... invertebrate biology indices between 2000 and 2005." EPA recommends the Revised SEIS provide more detail about this analysis as well as the general approach to and results of the monitoring conducted by the Sublette County Conservation District (SCCD). For example, is the biological monitoring approach used similar to, or consistent with, the Wyoming DEQ's bioassessment protocol? [see: Wyoming DEQ's *Redevelopment of the Wyoming Stream Integrity Index (WSII) for Assessing the Biological Condition of Wadeable Streams in Wyoming*]. At a minimum, EPA recommends the discussion include information about the biological metrics or index used, the basis for their derivation and application, and level of precision by which these analyses are able to define thresholds that would avoid "significant degradation of habitat for aquatic life" under Wyoming's narrative standard.

Once a target and threshold of change from the target have been identified, EPA recommends BLM implement a comprehensive water monitoring plan to ensure the BMPs are successfully mitigating the impacts from increased sedimentation and that the identified target is being met. At a minimum, we recommend that BLM establish a monitoring program in the most sensitive watersheds and the watersheds most likely to be impacted. EPA is concerned that such monitoring is not already ongoing, and looks forward to BLM establishing an effective



monitoring program and utilizing the results from those monitoring efforts to direct reclamation resources and efforts.

It is best to involve a system of BMPs that targets each stage of the erosion process to ensure success from construction activities. The most efficient approach involves minimizing the potential sources of sediment from the outset. This means limiting the extent and duration of land disturbance to the minimum needed, and protecting surfaces once they are exposed. BMPs should also involve controlling the amount of runoff and its ability to carry sediment by diverting incoming flows and impeding internally generated flows. And finally, BMPs should involve retaining sediment that is picked up on the project site through the use of sediment-capturing devices. On most sites successful erosion and sedimentation control requires a combination of structural and vegetative practices. Above all BMPs are best performed using advance planning, good scheduling and maintenance.

In the 2000 Pinedale Anticline ROD, BLM committed to implementing a monitoring program to ensure that the Green and New Fork Rivers continue to support their designated uses. Yet, the Draft SEIS indicates that it is not known if significant impact has occurred to surface water. EPA recommends BLM include a discussion of the surface monitoring program, any obstacles in implementing the program, and any monitored results in the Revised SEIS. Further, the Revised SEIS should analyze the potential for underground aquifer interaction with surface water and the potential resulting impacts should the benzene and hydrocarbon contamination reach these high value prime fisheries.

## **Wetlands**

As noted in the Revised Draft SEIS, certain wetlands are subject to protection pursuant to the Clean Water Act and Executive Order 11990. The Clean Water Act (CWA) Section 404 regulates discharge of dredged or fill material into "waters of the United States," including jurisdictional wetlands. Under CWA Section 404, permits for such discharges are generally issued by the U.S. Army Corps of Engineers, in accordance with EPA's CWA Section 404(b)(1) guidelines. These guidelines require, among other provisions, that no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem (40 CFR 230.10(d)). In addition, Executive Order 11990 – Protection of Wetlands (May 24, 1977) states in pertinent part as follows: "Section 1. (a) Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. (b) This Order does not apply to the issuance by Federal agencies of permits, licenses, or allocations to private parties for activities involving wetlands on non-Federal property." It should be noted that Executive Order 11990 is not limited to wetlands regulated under the Clean Water Act.



EPA considers the protection, improvement, and restoration of wetlands and riparian areas to be a high priority. Executive Order 11990 directs all Federal Agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. EPA recommends that, consistent with the Executive Order, indirect draining of, or direct disturbance of, wetland areas should be avoided if at all possible. If disturbance is unavoidable, BLM should commit to replace in kind such impacted wetlands and to a level that fully restores wetland function and value. Due to the time it can take to adequately reclaim disturbed wetlands and the potential life of this project, BLM may consider requiring mitigation to begin concurrent with the disturbance.

The Revised Draft SEIS provides updated information on potential impacts to wetlands from the Proposed Action and Preferred Alternative. An additional 183.9 acres of disturbance in riparian forest and riparian shrub vegetation are predicted, yet no mitigation for wetland and riparian resources has been identified (page 4-129). EPA recommends that the Revised SEIS discuss BLM's approach to implementing federal wetland policies and legal requirements in the continued development of the PAPA. In particular, EPA recommends the Revised SEIS clearly explain how BLM will be mitigating the loss and disturbance of wetlands and streams within and adjacent to the PAPA under Executive Order 11990. EPA is available to provide guidance and work with BLM towards development of a mitigation plan for the Revised SEIS and development of an implementation plan.

### **Greenhouse Gas Emissions**

EPA believes the greenhouse gases section in the Final SEIS should be expanded, keeping in mind that there are currently no EPA regulatory standards directly limiting greenhouse gas emissions<sup>1</sup>. While methane represents only 8 percent of the U.S. greenhouse gas emissions, it is 23 times more effective as a greenhouse gas than carbon dioxide. Oil and natural gas systems are the biggest contributor to methane emissions in the U.S., accounting for 26 percent of the total (EPA's Natural Gas Star Program and the US Emissions Inventory 2007: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005). EPA recommends that to the extent possible the Revised SEIS estimate and disclose the amount of methane and carbon dioxide emissions associated with each alternative in carbon dioxide-equivalent terms. As a point of comparison, EPA recommends the Revised SEIS consider utilizing a greenhouse gas equivalencies calculator to translate greenhouse gas emissions into terms that are easier to conceptualize. For example, a comparison of emissions to a range of other greenhouse gas

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<sup>1</sup> Since issuance of the April 2, 2007 Supreme Court opinion in *Massachusetts, et. al. v. EPA*, 127 S. Ct. 1438, 549 U.S. \_\_ (2007), EPA has begun to develop regulations to address greenhouse gas emissions from motor vehicles and fuels under the direction of the President's May 14, 2007 Executive Order and relevant Clean Air Act authorities. The Agency continues to evaluate the potential effects of the Court's decision with respect to addressing emissions of greenhouse gases under other provisions of the Clean Air Act. Thus, neither this comment letter nor the EIS for an individual project reflects, and should not be construed as reflecting, the type of judgment that might form the basis for a positive or negative finding under any provision of the Clean Air Act.



emitting sectors ([www.epa.gov/solar/energy-resources/calculator.html](http://www.epa.gov/solar/energy-resources/calculator.html)).

As part of a cumulative impact analysis, in the event the GHG emissions associated with the project are significant, EPA recommends the Revised SEIS compare annual projected greenhouse gas emissions from the proposed project to annual emissions from other existing and reasonably foreseeable future projects. In addition, we recommend that the Revised SEIS compare the annual greenhouse gas emissions from the proposed project to estimated annual greenhouse gas emissions at a regional, national, and global scale. Emissions of greenhouse gases in the United States have been quantified by the U.S. Department of Energy and EPA in publications released in 2007. EPA recommends that the cumulative impacts analysis also include a general, qualitative discussion of the anticipated effects of climate change, including potential effects at a regional level.

The Revised SEIS should also identify possible mitigation measures that may be implemented to reduce and capture methane gas and reduce potential impacts. There are a number of voluntary, cost-effective technologies and practices to reduce and off-set greenhouse gas emissions. Through EPA's Natural Gas STAR ([www.epa.gov/gasstar](http://www.epa.gov/gasstar)), EPA works with companies that produce, process, transmit and distribute natural gas to identify and promote the implementation of cost-effective technologies and practices to reduce emissions of methane, a potent greenhouse gas.

### **Accountability for Implementation of Effective Mitigation Measures**

The Revised Draft SEIS discloses the significant and unanticipated impacts to groundwater, air quality and wildlife that have occurred since implementation of the 2000 Pinedale Anticline ROD. Of particular concern:

- Benzene and other hydrocarbons have been detected in 88 of approximately 230 water supply wells sampled since monitoring began in 2004 (Revised Draft SEIS, page 3-84).
- Elevated ozone concentrations above the current National Ambient Air Quality Standard (NAAQS) have been recorded at Sublette County ambient air monitoring stations in 2005 and 2006 (Revised Draft SEIS, Table 3.11-2) and ground-level ozone concentrations have also increased.
- For 2005 "actual" emissions, a modeled 45 days of visibility impairment greater than 1.0 dv has occurred at the Class I Bridger Wilderness Area, 5 days at the Class I Fitzpatrick Wilderness Area, and additional days at other regional Class I areas (Revised Draft SEIS, page 3-73). For 2007, the predicted impacts to visibility are even higher with 62 days of visibility impairment predicted for the Bridger Wilderness Area (Revised Draft SEIS, page 4-78).
- Sage grouse male counts have declined by 51 percent on leks near the PAPA that were heavily impacted by gas wells from one year prior to well development in 1999 through 2004 (Revised Draft SEIS, page 3-135, Holloran, 2005).



Given the unforeseen and significant impacts that have occurred from the development of the 642 producing oil and gas wells approved under the 2000 Pinedale Anticline ROD, EPA believes that it is of the utmost importance that the Revised Draft SEIS identify effective and enforceable mitigation strategies to ensure environmental and public health protection as the proposed 4,399 additional wells on the Pinedale Anticline are developed. The Revised Draft SEIS should also develop a plan to mitigate the significant environmental impacts resulting from the oil and gas development that has already occurred on the PAPA. While the Revised Draft SEIS includes many of the necessary components that provide a starting point for mitigation, EPA recommends each of the mitigation plans include a mechanism for public accountability, such as stakeholder forums and/or annual status reports. Public accountability can be an important tool in ensuring mitigation targets are met in a timely manner.